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Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) An apparatus for measuring relative humidity of a mixture comprising:

a chamber having a chamber volume and an opening;

a membrane covering the opening, the membrane being permeable to water vapor while impermeable to liquid water;

a humidity sensor in the chamber volume for producing a first signal relating to relative humidity (RH_C) of the mixture within the chamber volume;

a first temperature sensor for producing a second signal relating to temperature (T_C) of the mixture within the chamber volume;

a second temperature sensor positioned for ambient contact with said mixture for producing a third signal relating to ambient temperature (T_A) of the mixture at a point exterior to the chamber; and

a processor coupled to the humidity sensor, the first temperature sensor, and the second temperature sensor for receiving the first, second, and third signals, wherein the processor is programmed to calculate relative humidity (RH_A)of the mixture at the point exterior to the chamber ~~as a function of the first signal, the second signal, and the third signal~~ according to the formula $RH_A = RH_C [ew_C/ew_A]$, where ew_C and ew_A are known saturation vapor pressures for T_C and T_A respectively.

2. (Original) The apparatus of claim 1 wherein internal surfaces of the chamber are constructed of a nonabsorbent material.

3. (Original) The apparatus of claim 2 wherein the chamber is entirely constructed of the nonabsorbent material or the internal surfaces are a coating of nonabsorbent material.

4. (Original) The apparatus of claim 2 wherein the nonabsorbent material is a metal.

5. (Previously presented) The apparatus of claim 2 wherein the nonabsorbent material is selected from the group consisting of brass, gold, tin, bronze, silver, platinum, and lead.